US Army Corps of Engineers®
Seattle District

July 16, 2005

Project Update

Flood and Coastal Storm Damage Reduction Project At Willapa Bay, Washington Shoalwater Bay Indian Reservation and Adjoining Property

Meeting Agenda

- Introductions
- May 2004 Community Meeting
- Future Conditions if Nothing is Done
- Proposed Corps of Engineers Project
- Real Estate Easements Needed
- Next Steps Toward Project Construction
- Your Questions and Concerns

Introductions:

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Shoalwater Bay Indian Tribe
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May 2004 Community Meeting:

- Interagency team of scientists presented findings of their studies. The team included U.S. Army Engineer Research and Development Center, U.S. Geological Survey, Washington Department of Ecology, and U.S. Army Corps of Engineers Seattle District.
- Technical studies included investigation of tides and tidal currents, waves, channel migration, shoreline and land surface changes, and sediment transport direction and rates. Tides and storm waves were modeled to evaluate their impact on the Tokeland Peninsula if nothing is done.
- Measures to address the flood and coastal storm damage threat were described.
- Major conclusions of our studies are:
  - Northern migration of the Willapa Channel has reversed course, sparing the remnants of the barrier dune on Empire Spit.
  - Channel coming from the Willapa River has followed a stable path for 150 years.
  - Since mid-1980's, slope of the north bank of the main channel has been constant and remained in a fixed position.
  - The channel encountered hard strata resistant to erosion.
  - **Modest engineering solutions are technically feasible to repair the damage and safeguard against future flooding and coastal storm damage.**

Future Conditions if Nothing is Done:

- The March 1999 storm, with a +13.61-foot high tide, generated 1.5-foot-high waves on the Shoalwater Reservation shoreline, resulting in flooding of low-lying uplands and roads.
- Due to continuing erosion and breaching of the barrier dune, that same storm today would generate 3.3-foot high waves. Flooding would be significantly more widespread.
- Tides exceeding +13 feet occurred 10 times in the past 32 years. Tides at or above +13 feet have occurred four times in the past six years.
- Infilling of North Cove with sand from the eroding barrier dune will accelerate, with complete loss of intertidal habitat.
- The Shoalwater Reservation and adjoining Dexter community property is increasingly vulnerable to flooding associated with storm-generated ocean waves – particularly during periods of high tides – if nothing is done.

Proposed Corps of Engineers Project:

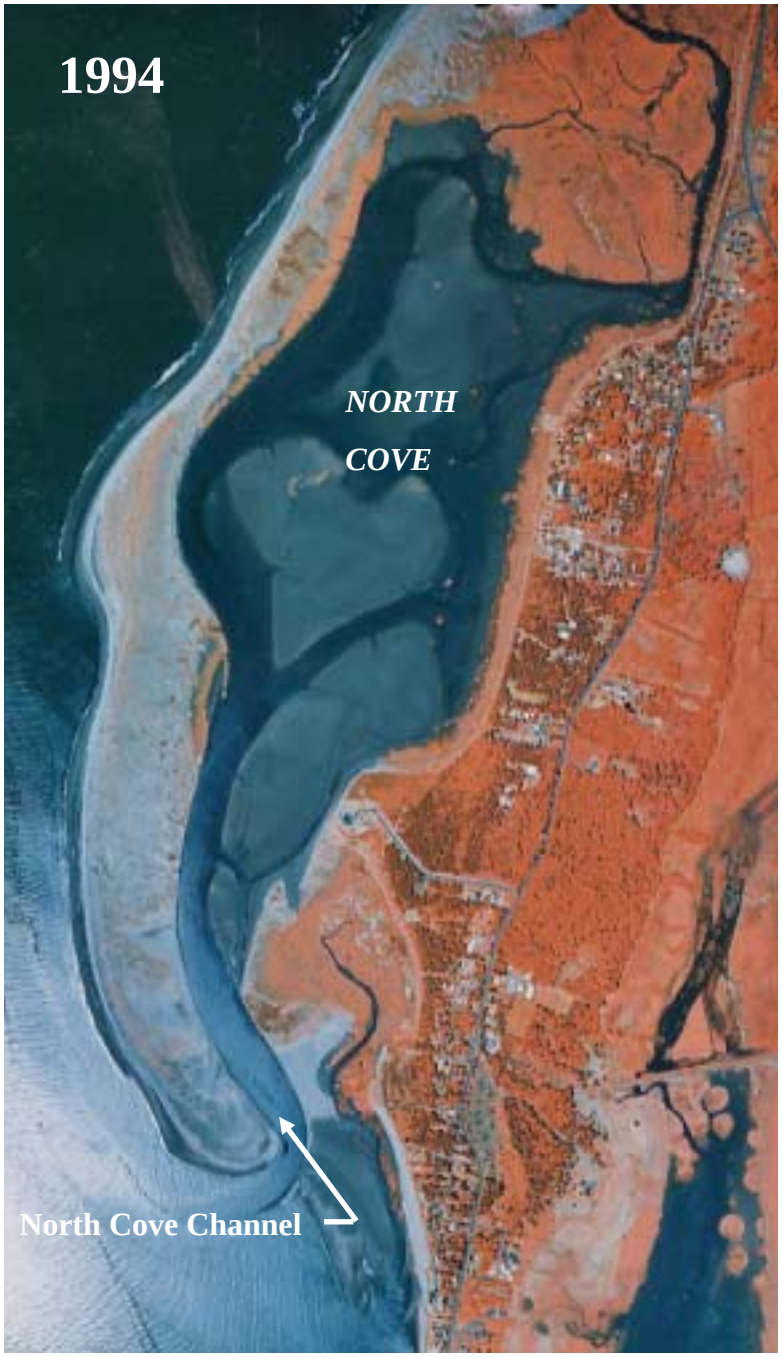
- Restore the eroded barrier dune on Empire Spit. 600,000 cubic yards of sand mined from borrow site along Willapa channel. Replenish sand every 10+ years, $12 million.
- Construct guardwall/flood barrier to the north and west along shoulder of State Highway 105 to Shoalwater Reservation boundary. 3,470 feet long, $1.6 million.
- Extend existing shoreline flood berm located in front of Tribal Center to the south and east along the Dexter community shoreline. 2,730 feet, $3 million.

Real Estate Easements Needed:

- Corps of Engineers will determine the easements required for construction and maintenance of the project.
- The Shoalwater Tribe will provide easements to Corps of Engineers for portions of project to be constructed on Tribal lands.
- Shoalwater Bay Indian Tribe will acquire easements from other property owners to enable Corps of Engineers to construct and maintain portions of project located on non-tribal lands.
- Dexter community land owners would be asked to provide easements to the Shoalwater Tribe to enable Corps of Engineers to construct and maintain the shoreline flood berm.
- Property owners will also be asked to grant easements to restore and maintain the barrier dune on Empire Spit.

Next Steps Toward Project Construction:

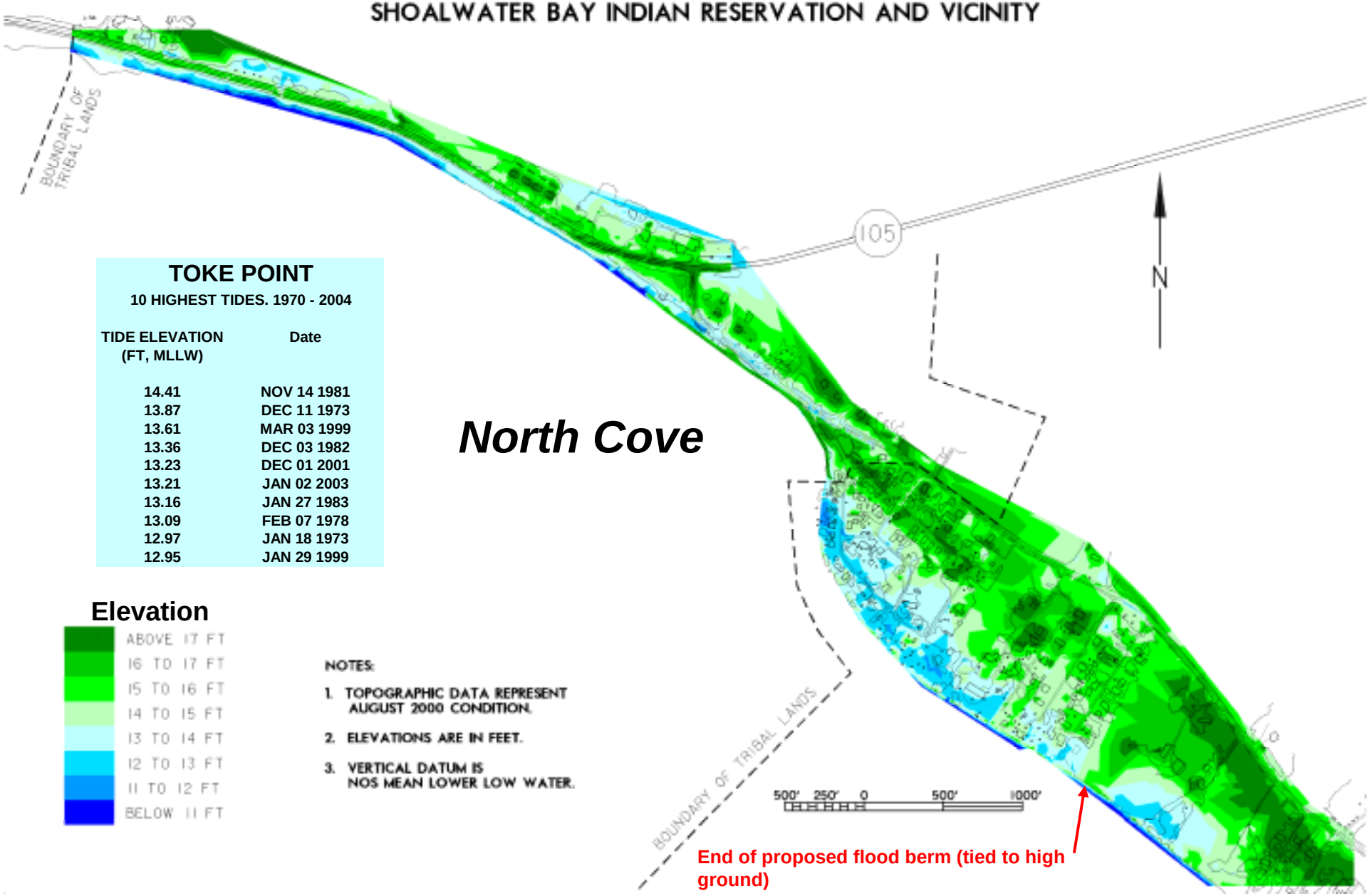
- Complete draft report and environmental documentation.
- Release draft report for public/agency review and comment. Conduct a public meeting.
- Submit report for approval in Washington, D.C.
- Receive fiscal year 2006 appropriation (possibly $2 million).
- Construct guardwall/flood barrier in 2006.
- Construct shoreline flood berm in 2007.
- Restore barrier dune in 2008-2009.


1994
NORTH
COVE
North Cove Channel


2004
NORTH
COVE
North Cove Channel

TOPOGRAPHY AND FLOOD POTENTIAL

SHOALWATER BAY INDIAN RESERVATION AND VICINITY



TOKE POINT

10 HIGHEST TIDES. 1970 - 2004

TIDE ELEVATION (FT, MLLW)	Date
14.41	NOV 14 1981
13.87	DEC 11 1973
13.61	MAR 03 1999
13.36	DEC 03 1982
13.23	DEC 01 2001
13.21	JAN 02 2003
13.16	JAN 27 1983
13.09	FEB 07 1978
12.97	JAN 18 1973
12.95	JAN 29 1999

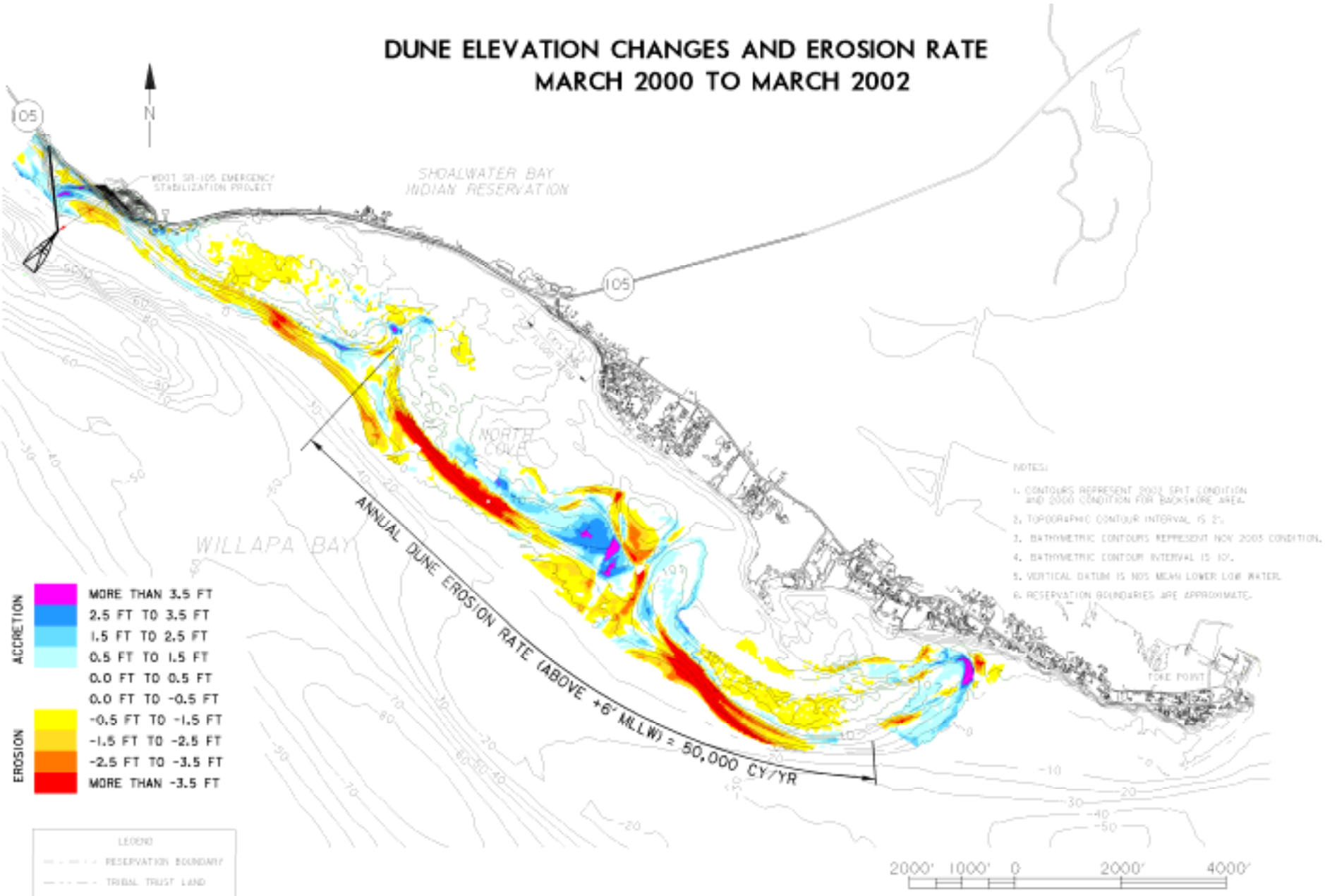
Elevation

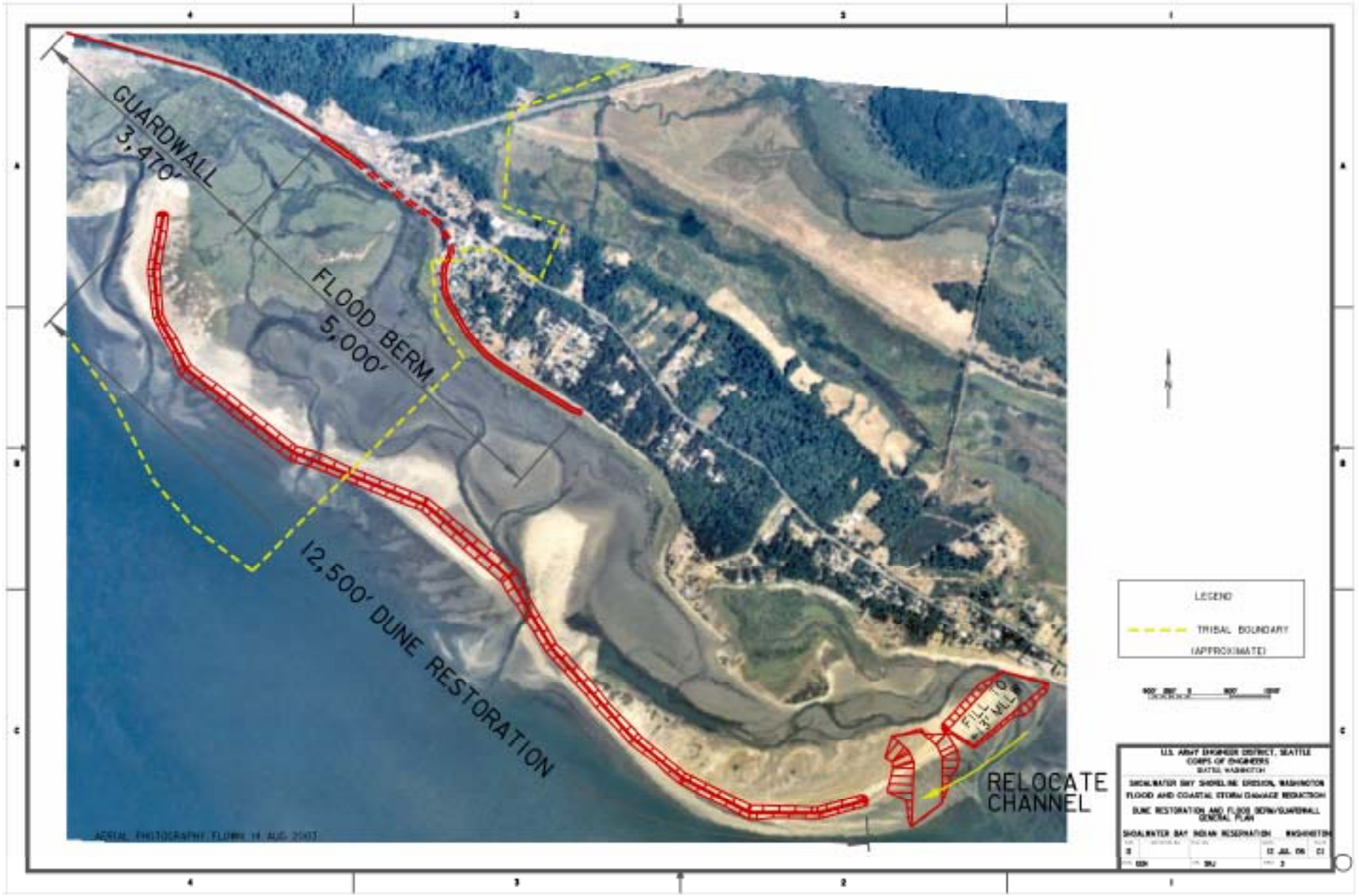
- ABOVE 17 FT
- 16 TO 17 FT
- 15 TO 16 FT
- 14 TO 15 FT
- 13 TO 14 FT
- 12 TO 13 FT
- 11 TO 12 FT
- BELOW 11 FT

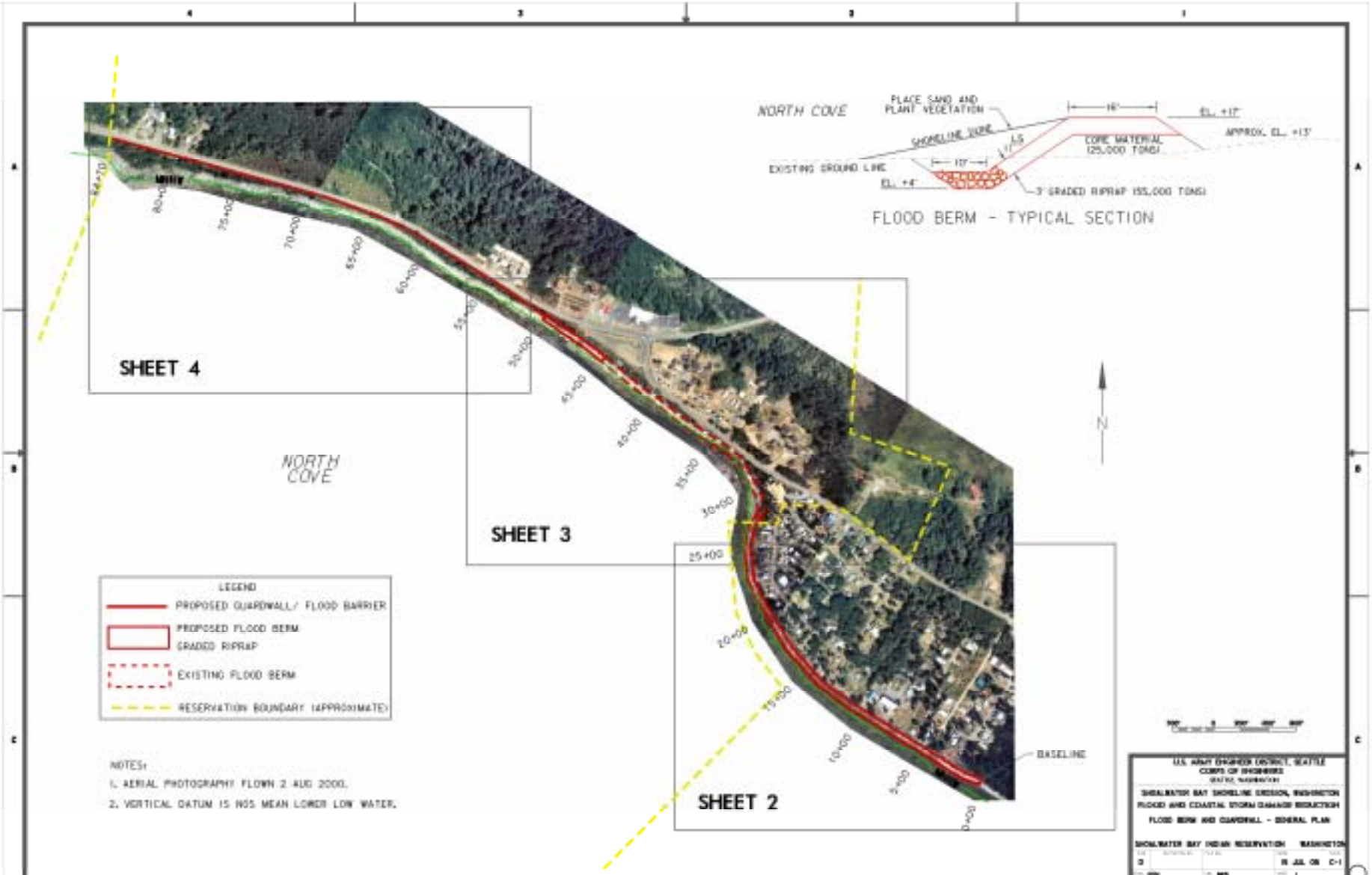
NOTES:

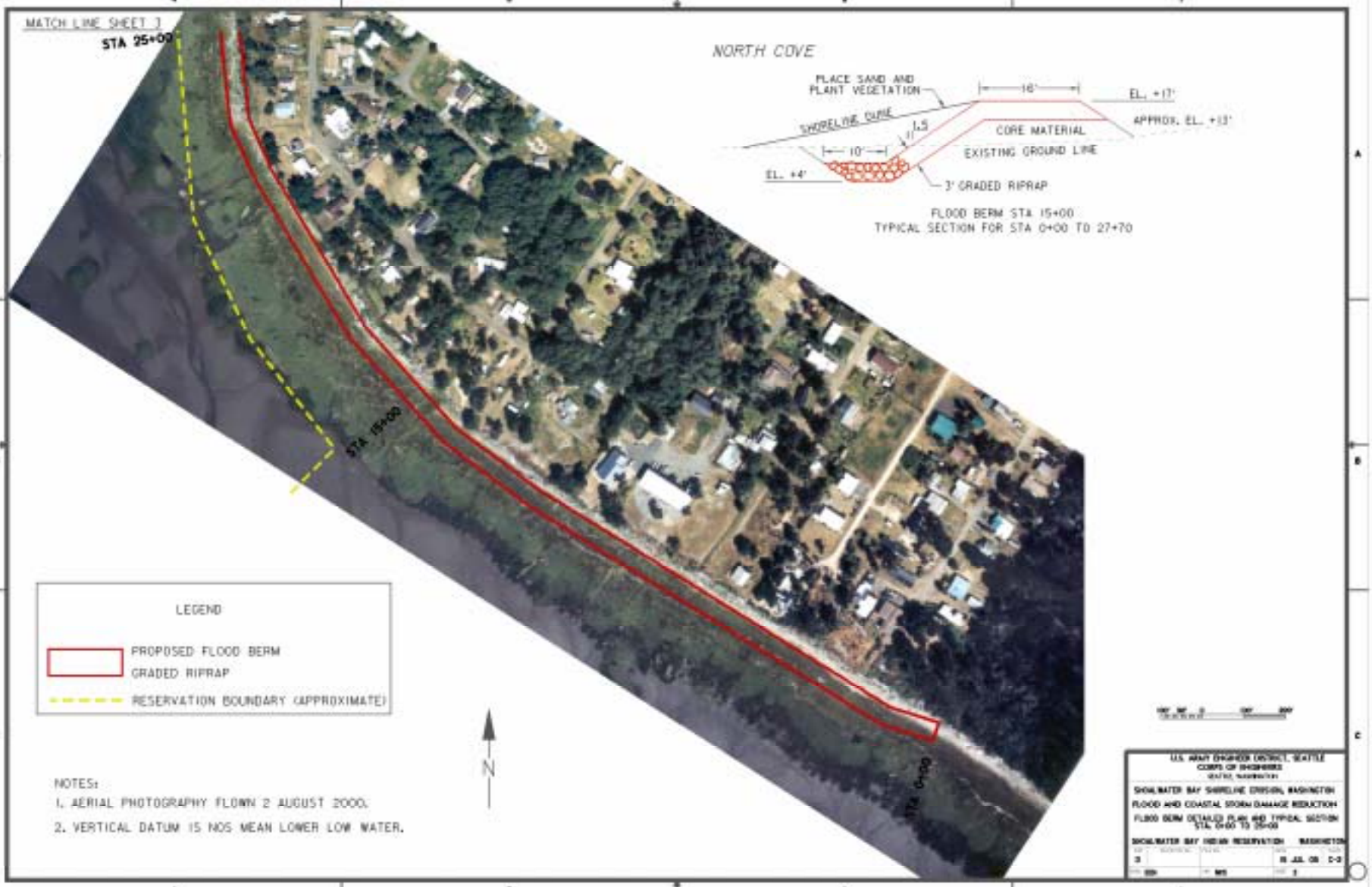
1. TOPOGRAPHIC DATA REPRESENT AUGUST 2000 CONDITION.
2. ELEVATIONS ARE IN FEET.
3. VERTICAL DATUM IS NOS MEAN LOWER LOW WATER.

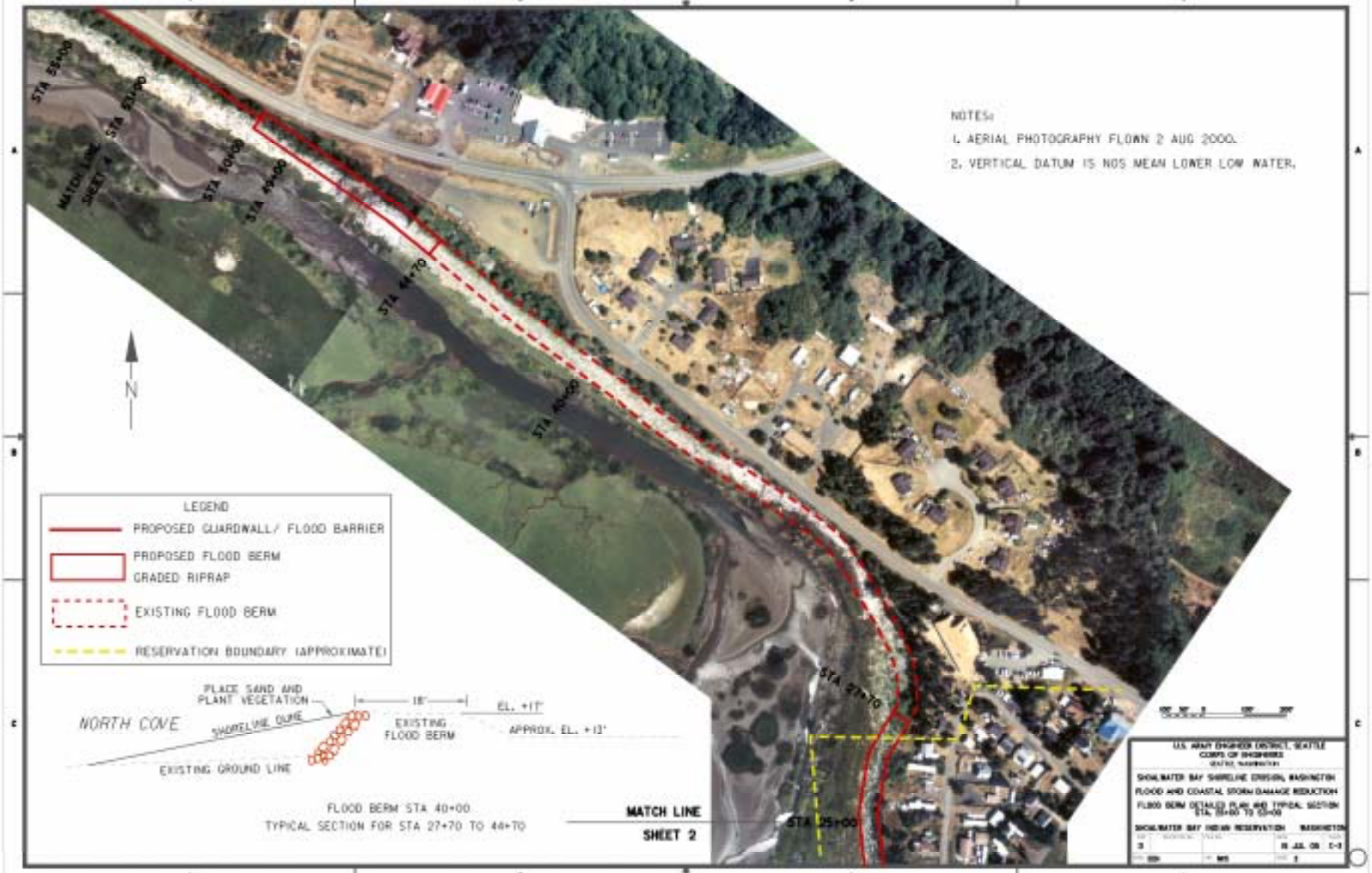
DUNE ELEVATION CHANGES AND EROSION RATE
MARCH 2000 TO MARCH 2002

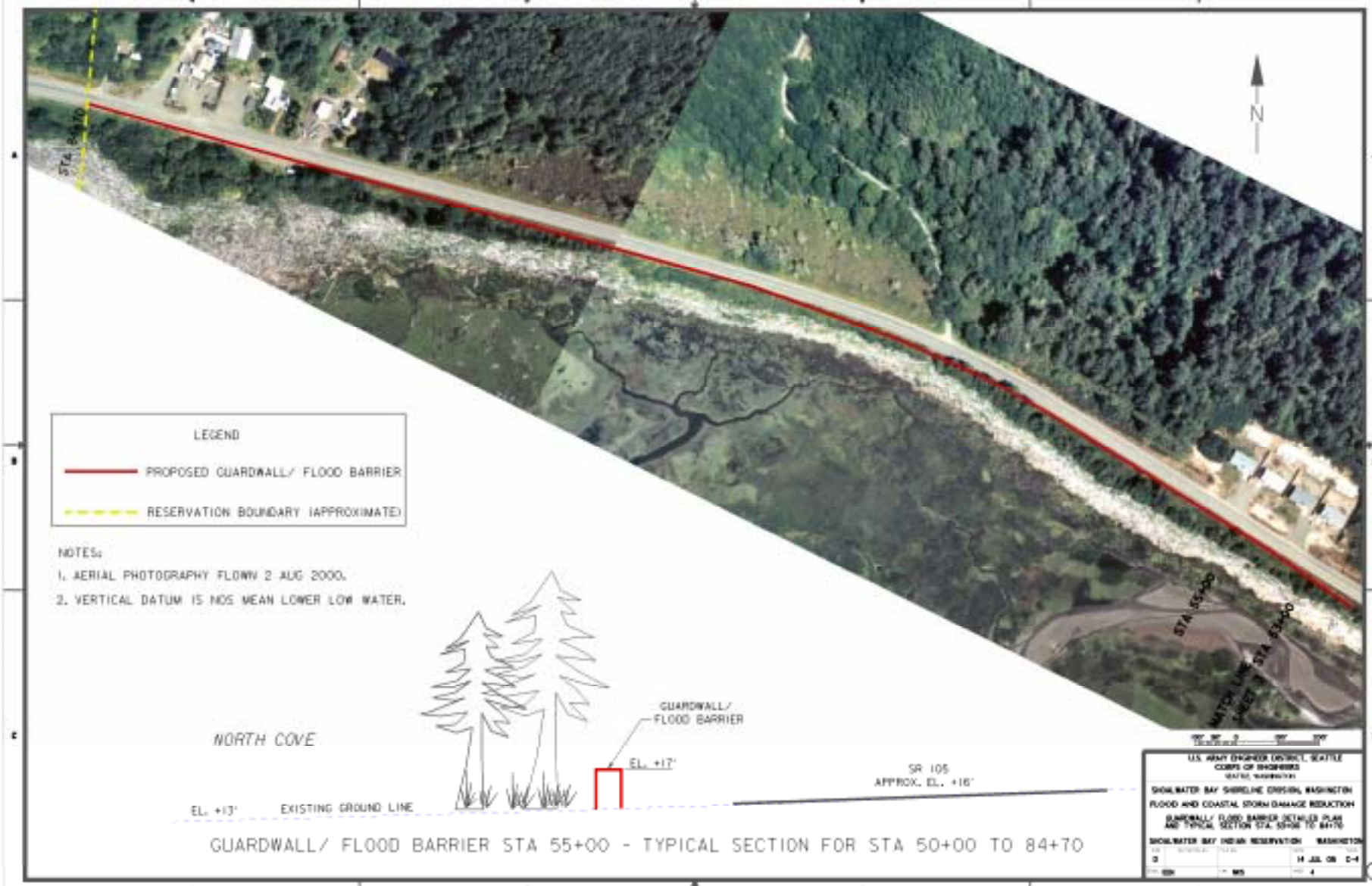



GUARDWALL
3,470'
FLOOD BERM
5,000'
12,500' DUNE RESTORATION
RELOCATE
CHANNEL
FILL TO
+7' MLLW
AERIAL PHOTOGRAPHY FLOWN 14 AUG 2003
LEGEND
TRIBAL BOUNDARY
(APPROXIMATE)
U.S. ARMY ENGINEER DISTRICT, SEATTLE
CORPS OF ENGINEERS
SEATTLE, WASHINGTON
SHOALWATER BAY SHORELINE EROSION, WASHINGTON
FLOOD AND COASTAL STORM Damage REDUCTION
DUNE RESTORATION AND FLOOD BERM/GUARDWALL
GENERAL PLAN
SHOALWATER BAY INDIAN RESERVATION WASHINGTON
12 JUL 06


NORTH COVE
PLACE SAND AND PLANT VEGETATION
SHORELINE SLOPE
EXISTING GROUND LINE
EL. +4'
CORE MATERIAL 125,000 TONS)
APPROX. EL. +13'
3' GRADED RIPRAP 155,000 TONS)
FLOOD BERM - TYPICAL SECTION
SHEET 4
SHEET 3
SHEET 2
NORTH COVE
N
LEGEND
PROPOSED GUARDWALL/ FLOOD BARRIER
PROPOSED FLOOD BERM GRADED RIPRAP
EXISTING FLOOD BERM
RESERVATION BOUNDARY (APPROXIMATE)
BASELINE
NOTES:
1. AERIAL PHOTOGRAPHY FLOWN 2 AUG 2000.
2. VERTICAL DATUM IS NGS MEAN LOWER LOW WATER.
SHOALWATER BAY SHORELINE EROSION, WASHINGTON
FLOOD AND COASTAL STORM DAMAGE REDUCTION
FLOOD BERM AND GUARDWALL - GENERAL PLAN
SHOALWATER BAY INDIAN RESERVATION WASHINGTON

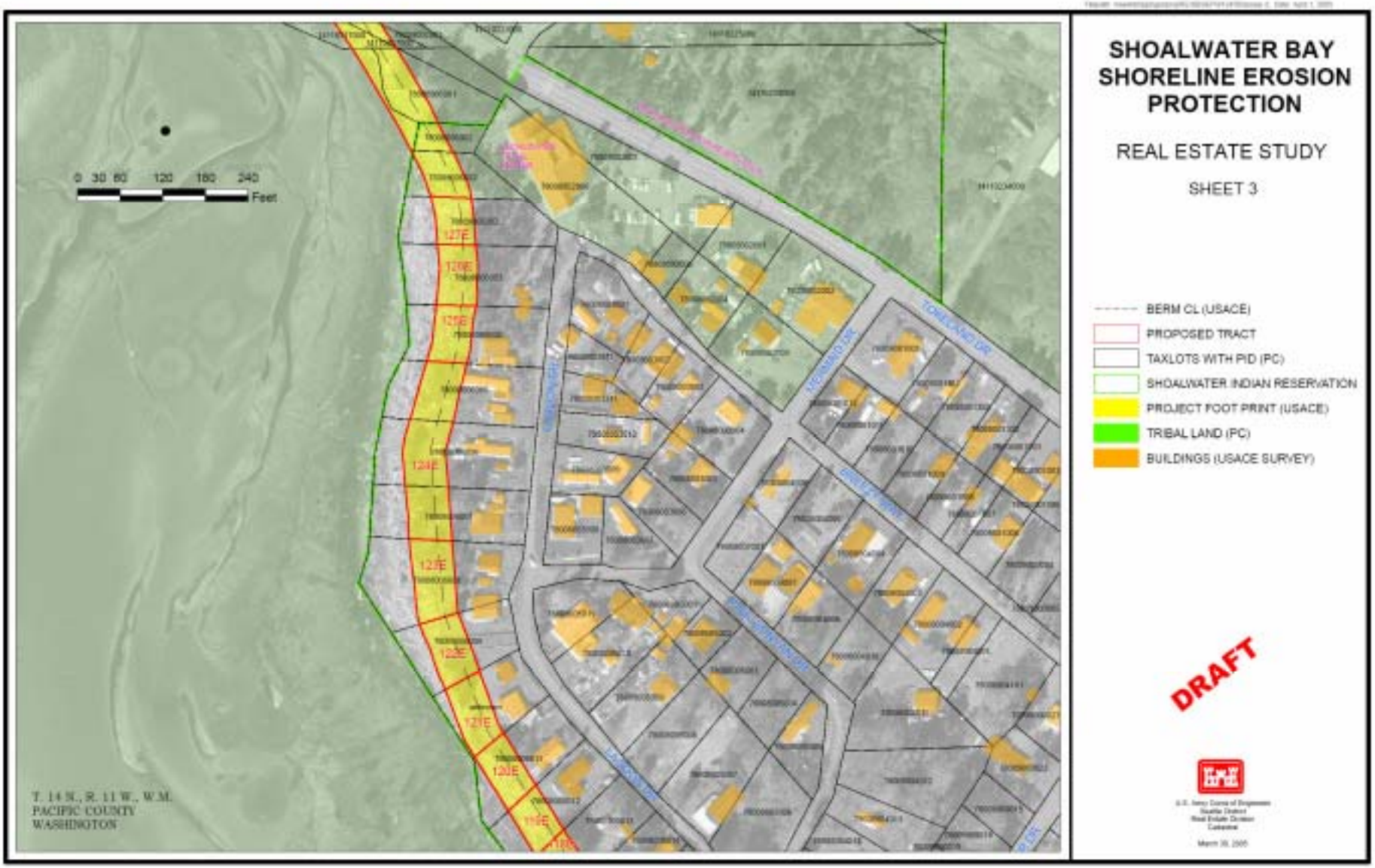

MATCH LINE SHEET 3
STA 25+00
NORTH COVE
PLACE SAND AND PLANT VEGETATION
16'
EL. +17'
SHORELINE DUNE
1:5
APPROX. EL. +13'
CORE MATERIAL
10'
EXISTING GROUND LINE
EL. +4'
3' GRADED RIPRAP
FLOOD BERM STA 15+00
TYPICAL SECTION FOR STA 0+00 TO 27+70
STA 15+00
STA 0+00
LEGEND
PROPOSED FLOOD BERM
GRADED RIPRAP
RESERVATION BOUNDARY (APPROXIMATE)
N
NOTES:
1. AERIAL PHOTOGRAPHY FLOWN 2 AUGUST 2000.
2. VERTICAL DATUM IS NGS MEAN LOWER LOW WATER.
U.S. ARMY ENGINEER DISTRICT, SEATTLE
CORPS OF ENGINEERS
SHOALWATER BAY SHORELINE EROSION, WASHINGTON
FLOOD AND COASTAL STORM DAMAGE REDUCTION
FLOOD BERM DETAILED PLAN AND TYPICAL SECTION
STA. 0+00 TO 25+00
SHOALWATER BAY INDIAN RESERVATION WASHINGTON
15 JUL 05
D-3


STA 55+00
STA 53+00
MATCHLINE SHEET 4
STA 49+00
STA 44+70
STA 40+00
STA 27+70
STA 25+00
N
NOTES:
1. AERIAL PHOTOGRAPHY FLOWN 2 AUG 2000.
2. VERTICAL DATUM IS NOS MEAN LOWER LOW WATER.
LEGEND
PROPOSED GUARDWALL/ FLOOD BARRIER
PROPOSED FLOOD BERM GRADED RIPRAP
EXISTING FLOOD BERM
RESERVATION BOUNDARY (APPROXIMATE)
PLACE SAND AND PLANT VEGETATION
18'
EL. +17'
NORTH COVE
SHORELINE DUNE
EXISTING FLOOD BERM
APPROX. EL. +13'
EXISTING GROUND LINE
FLOOD BERM STA 40+00
TYPICAL SECTION FOR STA 27+70 TO 44+70
MATCH LINE
SHEET 2
U.S. ARMY ENGINEER DISTRICT, SEATTLE
CORPS OF ENGINEERS
SHOALWATER BAY SHORELINE EROSION, WASHINGTON
FLOOD AND COASTAL STORM DAMAGE REDUCTION
FLOOD BERM DETAILS PLAN AND TYPICAL SECTION
STA 25+00 TO 57+00
SHOALWATER BAY INDIAN RESERVATION WASHINGTON


STA 84+70
N
LEGEND
PROPOSED GUARDWALL/ FLOOD BARRIER
RESERVATION BOUNDARY (APPROXIMATE)
NOTES:
1. AERIAL PHOTOGRAPHY FLOWN 2 AUG 2000.
2. VERTICAL DATUM IS NOS MEAN LOWER LOW WATER.
STA 55+00
MATCH LINE STA 53+00 SHEET 3
NORTH COVE
GUARDWALL/ FLOOD BARRIER
EL. +17'
SR 105
APPROX. EL. +16'
EL. +13'
EXISTING GROUND LINE
GUARDWALL/ FLOOD BARRIER STA 55+00 - TYPICAL SECTION FOR STA 50+00 TO 84+70
U.S. ARMY ENGINEER DISTRICT, SEATTLE
CORPS OF ENGINEERS
SEATTLE, WASHINGTON
SHOALWATER BAY SHORELINE EROSION, WASHINGTON
FLOOD AND COASTAL STORM DAMAGE REDUCTION
GUARDWALL/ FLOOD BARRIER DETAILED PLAN AND TYPICAL SECTION STA. 55+00 TO 84+70
SHOALWATER BAY INDIAN RESERVATION WASHINGTON
14 JUL 06
C-4

IMPORTANT NOTEAND DICLAIMER REGARDING THE FOLLOWING THREE DRAFT REAL ESTATE STUDY DRAWINGS:

- The three photograph maps that follow are preliminary drafts of our real estate study for this project. We acknowledge the opinions of many reviewers that there are problems with Pacific County's real estate records, as depicted on these maps. We will have to resolve discrepancies in order for easements to be obtained from willing property owners for the construction and maintenance by the U.S Army Corps of Engineers of the proposed flood berm. The property boundaries depicted by the black lines on the following three photograph maps came from Pacific County records, and may or may not accurately represent actual property boundaries.
- A preliminary alignment for the proposed flood berm is depicted by the red lines with yellow fill color, and was derived from our engineer's initial alignment. When overlaid with the real estate map, this revealed that the proposed flood berm would encroach on landscaping and possibly some structures. Consequently, the engineers realigned the proposed flood berm to completely avoid existing structures and landscaping.
- Our current proposed alignment for the flood berm is as depicted on the previous four color aerial photographs, and not the three draft real estate drawings. Due to the apparent Pacific County property boundary issues, the three real estate maps have not yet been redrawn to show our current flood berm alignment.



SHOALWATER BAY SHORELINE EROSION PROTECTION

REAL ESTATE STUDY

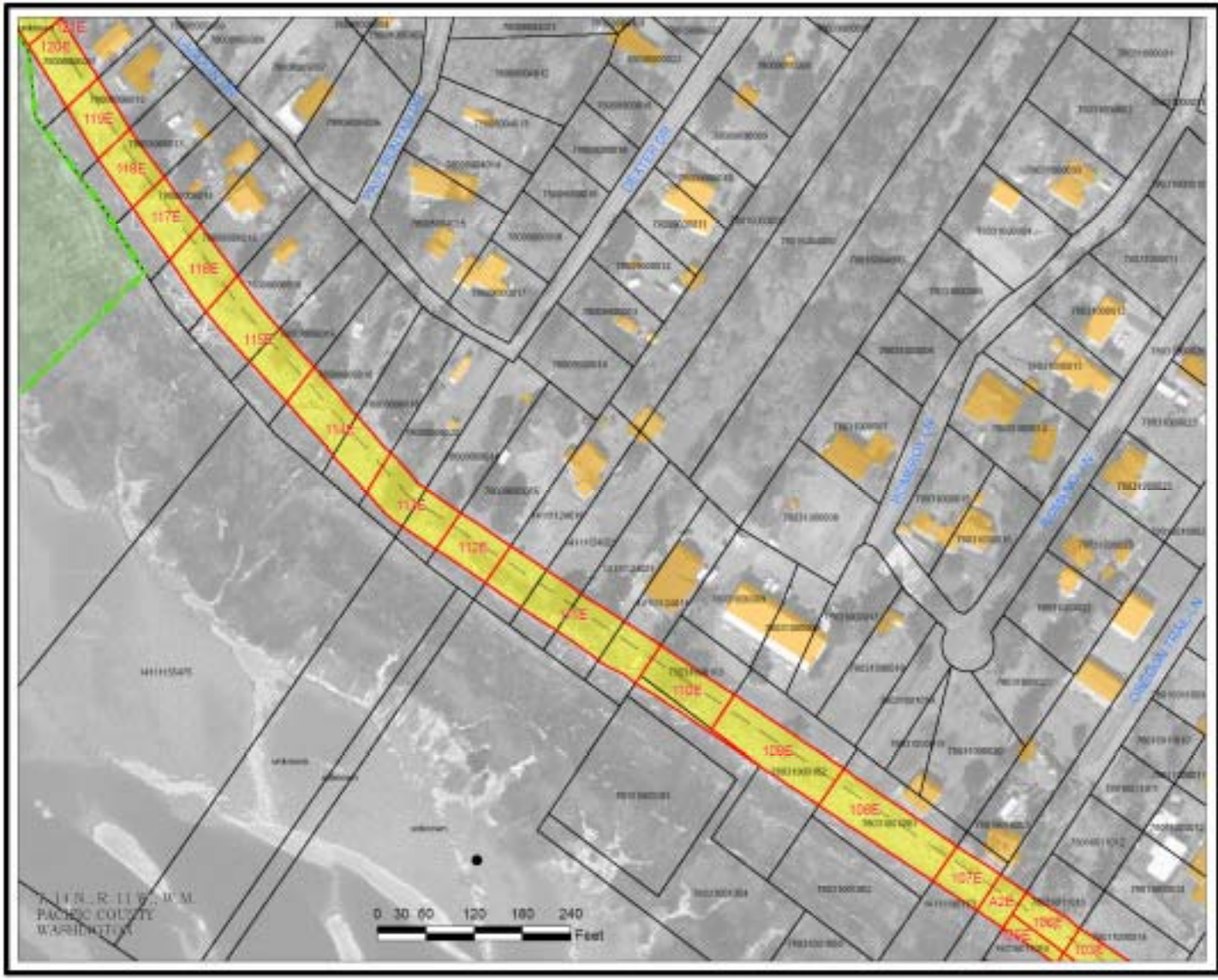
SHEET 3

- BERM CL (USACE)
- PROPOSED TRACT
- TAXLOTS WITH PID (PC)
- SHOALWATER INDIAN RESERVATION
- PROJECT FOOT PRINT (USACE)
- TRIBAL LAND (PC)
- BUILDINGS (USACE SURVEY)

DRAFT

U.S. Army Corps of Engineers
Seattle District
Real Estate Division
Cadastral

March 30, 2005



SHOALWATER BAY SHORELINE EROSION PROTECTION

REAL ESTATE STUDY

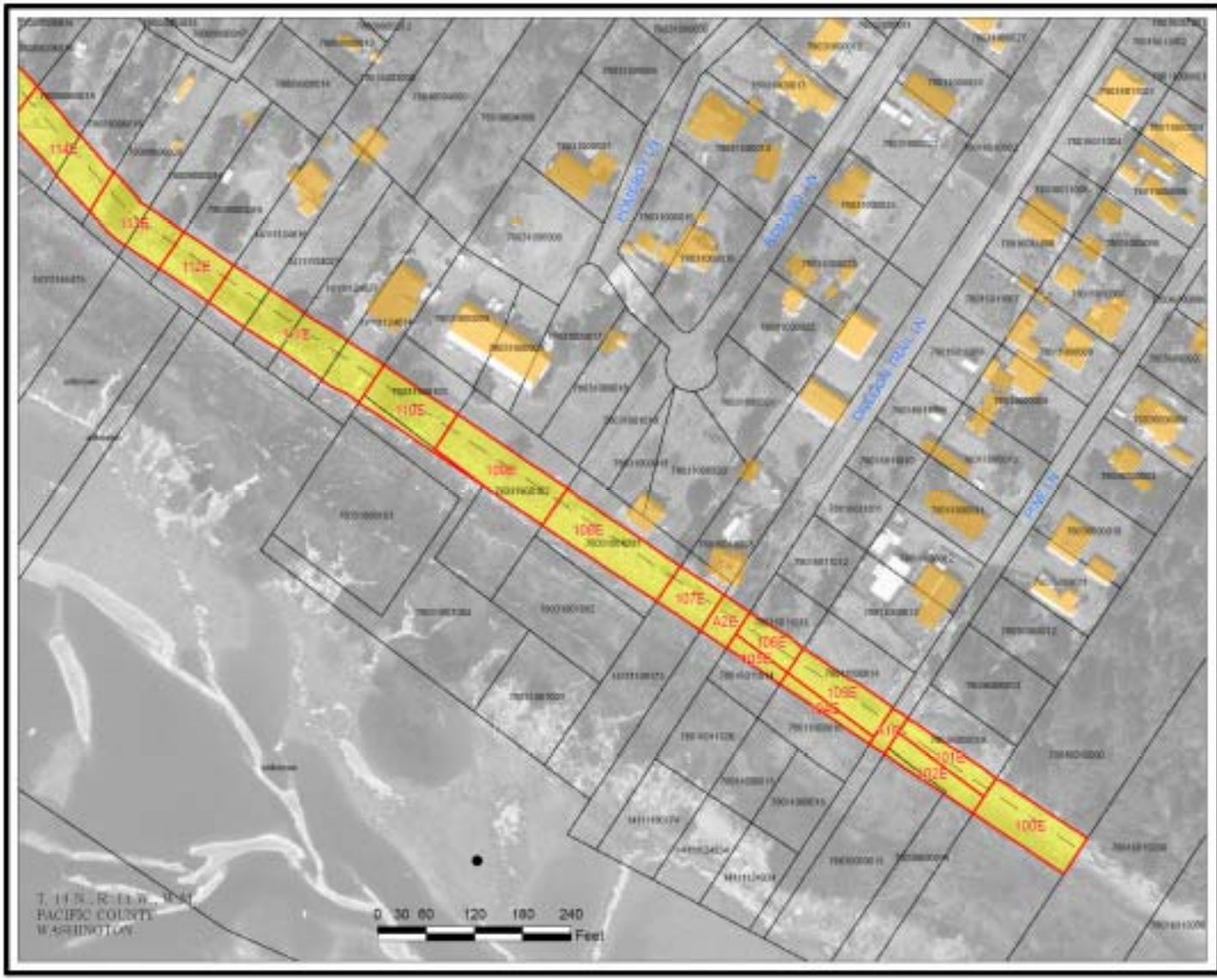
SHEET 4

- BERM CL (USACE)
- TAXLOTS WITH PID (PC)
- SHOALWATER INDIAN RESERVATION
- PROJECT FOOT PRINT (USACE)
- PROPOSED TRACT
- TRIBAL LAND (PC)
- BUILDINGS (USACE SURVEY)

DRAFT

U.S. Army Corps of Engineers
Seattle District
Real Estate Division
Cartography

March 30, 2005



SHOALWATER BAY SHORELINE EROSION PROTECTION

REAL ESTATE STUDY

SHEET 5

- BERM CL (USACE)
- PROPOSED TRACT
- TAXLOTS WITH PID (PC)
- SHOALWATER INDIAN RESERVATION
- PROJECT FOOT PRINT (USACE)
- BUILDINGS (USACE SURVEY)

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April 1, 2005